

IN THE CLAIMS

Claim 1 (currently amended). A pressure-sensitive adhesive tape ~~with having~~ a flat carrier material which is coated on both sides with a pressure-sensitive adhesive, ~~characterized in that wherein~~ at least one side of the carrier material is coated with a **polymer-based** pressure-sensitive adhesive ~~which is preearable comprising polymers formed~~ from a monomer mixture ~~comprising of~~ at least the following components:

- i.a) 49.5% - 89.5% by weight (based on the monomer mixture) of acrylic esters and/or methacrylic esters and/or the corresponding free acids with the following formula:
 $\text{CH}_2=\text{CH}(\text{R}_1)(\text{COOR}_2)$,
where $\text{R}_1 = \text{H}$ or CH_3 and R_2 is an alkyl radical having 1 to 10 carbon atoms or H and the homopolymer possesses a static glass transition temperature of $< -30^\circ\text{C}$;
- i.b) 10% to 40% by weight (based on the monomer mixture) of acrylic esters and/or methacrylic esters with the following formula:
 $\text{CH}_2=\text{CH}(\text{R}_3)(\text{COOR}_4)$,
where $\text{R}_3 = \text{H}$ or CH_3 and R_4 is a cyclic alkyl radical having at least 8 carbon atoms or a linear alkyl radical having at least 12 carbon atoms and the homopolymer possesses a static glass transition temperature of at least 30°C ;
- i.c) 0.5% - 10% by weight (based on the monomer mixture) of acrylic esters and/or methacrylic esters with the following formula:
 $\text{CH}_2=\text{CH}(\text{R}_3)(\text{COOR}_5)$,
where $\text{R}_3 = \text{H}$ or CH_3 and $\text{R}_5 = \text{H}$ or an aliphatic radical containing a functional group X, X comprising COOH , OH , $-\text{NH}$, NH_2 , SH , SO_3H , and the homopolymer possesses a static glass transition temperature of at least 30°C .

Claim 2 (currently amended). The pressure-sensitive adhesive tape of claim 1, ~~characterized in that wherein~~ the polymers of the **polymer-based** pressure-sensitive adhesive have a molar mass M_n of between about 10 000 and about 600 000 g/mol, ~~preferably between about 30 000 and about 400 000 g/mol, more preferably between about 50 000 and about 300 000~~.

Claim 3 (currently amended). The pressure-sensitive adhesive tape of ~~one of claims 1 or 2, characterized in that claim 1, wherein~~ the polymers of the ~~polymer-based~~ pressure-sensitive adhesive ~~have been~~ ~~are~~ crosslinked.

Claim 4 (currently amended). The pressure-sensitive adhesive tape of ~~any one of the preceding claims 1 to 3, characterized in that the polymer chains of the polymer-based pressure-sensitive adhesive claim 1, wherein said polymers~~ are present in a branched state as graft polymers.

Claim 5 (currently amended). The pressure-sensitive adhesive tape of ~~any one of the preceding claims 1 to 4, characterized in that claim 1, wherein said pressure-sensitive adhesive comprises~~ tackifier resins ~~have been admixed to the pressure-sensitive adhesives.~~

Claim 6 (currently amended). The pressure-sensitive adhesive tape of claim 5, ~~characterized in that wherein~~ the weight fraction of the tackifier resins as a proportion of the polymer is up to 40% by weight, ~~preferably up to 30% by weight~~.

Claim 7 (currently amended). The pressure-sensitive adhesive tape of ~~any one of the preceding claims 1 to 6, characterized in that to the polymer-based claim 1, wherein the pressure-sensitive adhesive further additives, especially comprises additives selected from the group consisting of~~ plasticizers, fillers, ~~preferably fibers, carbon black, zinc oxide, titanium oxide, chalk, solid glass beads, hollow glass beads, microbeads of other materials, silica and/or silicates, nucleators, expandants, compounding agents, and/or aging inhibitors, especially primary and secondary antioxidants and/or and~~ light stabilizers.

Claim 8 (currently amended). The pressure-sensitive adhesive tape of ~~any one of the preceding claims 1 to 7, characterized in that claim 1, wherein~~ the carrier material is a film, ~~in particular~~ a film of polyester, PET, PE, PP, BOPP or PVC.

Claim 9 (currently amended). The pressure-sensitive adhesive tape of ~~any one of the preceding claims 1 to 8, characterized in that claim 1, wherein~~ the carrier material is a foam carrier, ~~in particular~~ a polymer foam, ~~consisting preferably of PU, PVC or polyolefin, more preferably consisting of PE or PP.~~

Claim 10 (currently amended). The pressure-sensitive adhesive tape of ~~any one of the preceding claims 1 to 9, characterized in that as a~~ claim 1, wherein the carrier material ~~it comprises~~ is a combination of a film and at least one foam carrier, the film being connected, ~~in particular~~ by adhesive bonding, to the at least one foam carrier.

Claim 11 (currently amended). The pressure-sensitive adhesive tape of ~~any one of claims 8 to 10, characterized in that~~ claim 8, wherein the film is a film made of PET, ~~in particular with~~ and has a thickness of 5 to 500 μm , ~~preferably 5 to 60 μm , with particular preference 23 μm .~~

Claim 12 (currently amended). The pressure-sensitive adhesive tape of ~~any one of the preceding claims 1 to 11, characterized in that~~ claim 1, wherein the carrier material ~~has been~~ is pretreated physically, ~~in particular~~ by flame, corona and/or plasma, and/or chemically, ~~in particular by etching, partial etching~~ and/or by provision with primer, ~~preferably reactive primer.~~

Claim 13 (currently amended). The pressure-sensitive adhesive tape of ~~any one of the preceding claims 1 to 12, characterized in that it has~~ claim 1, having a liner on one or both sides ~~a liner, in particular a paper or film liner, preferably made of double-sidedly siliconized film.~~

Claim 14 (currently amended). The pressure-sensitive adhesive tape of ~~any one of the preceding claims 2 to 13, characterized in that~~ claim 1, wherein two sides of the adhesive tape are coated with pressure-sensitive adhesive, and the two sides of the adhesive tape have pressure-sensitive adhesives differing in bond strength.

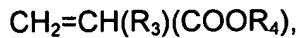
Claim 15 (currently amended). A free-radical polymerization method of producing a ~~polymer-based pressure-sensitive adhesive, in particular for producing a~~ the pressure-sensitive adhesive tape of ~~any one of claims 1 to 14, in which~~ claim 1, wherein a reaction solution of a monomer mixture, ~~in particular~~ comprising at least the following components:

i.a) 49.5% - 89.5% by weight (based on the monomer mixture) of acrylic esters and/or methacrylic esters and/or the corresponding free acids with the following formula:



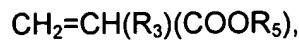
where $R_1 = H$ or CH_3 and R_2 is an alkyl radical having 1 to 10 carbon atoms or H and the homopolymer possesses a static glass transition temperature of $< -30^\circ C$;

i.b) 10% to 40% by weight (based on the monomer mixture) of acrylic esters and/or methacrylic esters with the following formula:



where $R_3 = H$ or CH_3 and R_4 is a cyclic alkyl radical having at least 8 carbon atoms or a linear alkyl radical having at least 12 carbon atoms and the homopolymer possesses a static glass transition temperature of at least $30^\circ C$;

i.c) 0.5% - 10% by weight (based on the monomer mixture) of acrylic esters and/or methacrylic esters with the following formula:



where $R_3 = H$ or CH_3 and $R_5 = H$ or an aliphatic radical containing a functional group X , X comprising $COOH$, OH , $-NH$, NH_2 , SH , SO_3H , and the homopolymer possesses a static glass transition temperature of at least $30^\circ C$,

with the addition of an initiator having a grafting activity of $\epsilon < 5$ and of an initiator having a grafting activity of $\epsilon > 5$, is prepared and polymerized, and the resulting polymers are crosslinked.

Claim 16 (currently amended). The method of claim 15, ~~characterized in that wherein~~ first the initiator having a grafting activity of $\epsilon < 5$ is added for ~~the a~~ linear polymerization and then the initiator having a grafting activity of $\epsilon > 5$ is added for ~~the a~~ graft polymerization of the reaction solution.

Claim 17 (currently amended). The method of claim 16, ~~characterized in that wherein~~ after the initiator having a grafting activity of $\epsilon < 5$ ~~has been is~~ added and before the initiator having a grafting activity of $\epsilon > 5$ ~~has been is~~ added, initiation is repeated at least once with an initiator having a grafting activity of $\epsilon < 5$.

Claim 18 (original). The method of any one of claims 15 to 17, characterized in that the reaction is controlled by diluting the reaction solution in accordance with the viscosity of the polymer.

Claim 19 (currently amended). The method of any one of claims 15 to ~~48~~ 17, ~~characterized in that wherein~~ the polymerization is carried out at a temperature of 50 – 90°C.

Claim 20 (currently amended). The method of any one of claims 15 to ~~49~~ 17, ~~characterized in that wherein~~ the initiator having a grafting activity of $\varepsilon > 5$ is used in an amount of up to 2% by weight, based on the monomer mixture.

Claim 21 (currently amended). The method of any one of claims 15 to ~~20~~ 17, ~~characterized in that wherein~~ the initiator having a grafting activity of $\varepsilon > 5$ has a grafting activity of $\varepsilon > 10$ ~~and in particular is bis(4-tert-butylcyclohexyl) peroxide dicarbonate or dibenzoyl peroxide.~~

Claim 22 (currently amended). The method of any one of claims 15 to ~~24~~ 17, ~~characterized in that wherein~~ the initiator having a grafting activity of $\varepsilon < 5$ ~~comprises azo initiators, especially azobisisobutyronitrile or derivatives thereof, preferably is~~ 2,2-azobis(2-methylbutyronitrile).

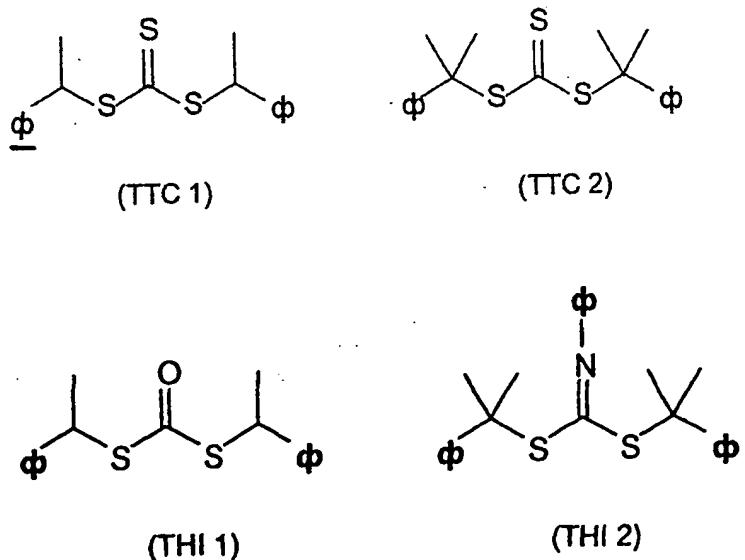
Claim 23 (currently amended). The method of any one of claims 15 to ~~22~~ 17, ~~characterized in that wherein~~ the polymerization is carried out to a conversion of at least 90%, ~~in particular at least 95%.~~

Claim 24 (currently amended). The method of any one of claims 15 to ~~23~~ 17, ~~characterized in that wherein~~ the method is carried out as a controlled polymerization, ~~in particular~~ with the addition of regulator substances.

Claim 25 (currently amended). The method of claim 24, ~~characterized in that as wherein said regulator substance use is made of at least one is selected~~ from the group consisting of 2,2,5,5-tetramethyl-1-pyrrolidinyloxy (PROXYL), 3-carbamoyl-PROXYL, 2,2-dimethyl-4,5-cyclohexyl-PROXYL, 3-oxo-PROXYL, 3-hydroxylimine-PROXYL, 3-aminomethyl-PROXYL, 3-methoxy-PROXYL, 3-t-butyl-PROXYL, 3,4-di-t-butyl-PROXYL; 2,2,6,6-tetramethyl-1-piperidinyloxy ~~pyrrolidinyloxy~~ (TEMPO), 4-benzoyloxy-TEMPO, 4-methoxy-TEMPO, 4-chloro-TEMPO, 4-hydroxy-TEMPO, 4-oxo-TEMPO, 4-amino-TEMPO, 2,2,6,6-tetraethyl-1-piperidinyloxy, 2,2,6-trimethyl-6-ethyl-1-piperidinyloxy, N-tert-butyl 1-phenyl-2-methylpropyl nitroxide, N-tert-butyl 1-(2-naphthyl)-2-methylpropyl nitroxide, N-tert-butyl

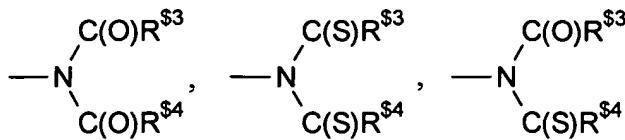
1-diethylphosphono-2,2-dimethylpropyl nitroxide, N-tert-butyl 1-dibenzylphosphono-2,2-dimethylpropyl nitroxide, N-(1-phenyl-2-methylpropyl) 1-diethylphosphono-1-methylethyl nitroxide, di-t-butyl nitroxide, diphenyl nitroxide, and tert-butyl tert-amyl nitroxide.

Claim 26 (currently amended). The method of ~~one of claims 24 or 25, characterized in that claim 24, wherein~~ the controlled polymerization is a variant of the RAFT polymerization, in which **preferably** the trithiocarbonates TTC1 and TTC2 or the thio compounds THI1 and THI2 or the thioesters THE are used, Φ



being an unfunctionalized phenyl group or a phenyl group functionalized with alkyl or aryl substituents attached directly or via ester or ether bridges, a functionalized phenyl group, functionalized preferably with halogen, hydroxyl, epoxy and/or nitrogen-containing or sulfur-containing groups, a cyano group or a saturated or unsaturated aliphatic radical, and where $R^{\$1}$ and $R^{\$2}$ are chosen independently of one another and $R^{\$1}$ can be a radical from one of groups i) to iv) below, and $R^{\$2}$ a radical from one of groups i) to iii) below:

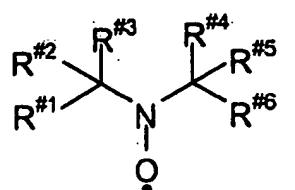
- i) C_1 to C_{18} alkyl, C_2 to C_{18} alkenyl, C_2 to C_{18} alkynyl, each linear or branched; aryl, phenyl, benzyl, aliphatic and aromatic heterocycles.



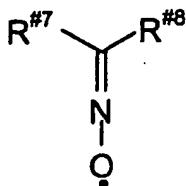
- ii) $-\text{NH}_2$, $-\text{NH}-\text{R}^{\$3}$, $-\text{NR}^{\$3}\text{R}^{\$4}$, $-\text{NH}-\text{C}(\text{O})-\text{R}^{\$3}$, $-\text{NR}^{\$3}-\text{C}(\text{O})-\text{R}^{\$4}$, $-\text{NH}-\text{C}(\text{S})-\text{R}^{\$3}$, $-\text{NR}^{\$3}-\text{C}(\text{S})-\text{R}^{\$4}$, where $\text{R}^{\$3}$ and $\text{R}^{\$4}$ are radicals selected independently of one another from group i).
- iii) $-\text{S}-\text{R}^{\$5}$ or $-\text{S}-\text{C}(\text{S})-\text{R}^{\$5}$, $\text{R}^{\$5}$ preferably being a radical from one of groups i) or ii).
- iv) $-\text{O}-\text{R}^{\$6}$ or $-\text{O}-\text{C}(\text{O})-\text{R}^{\$6}$, $\text{R}^{\$6}$ preferably being a radical from one of groups i) or ii).

Claim 27 (currently amended). The method of ~~any one of claims 24 to 26, characterized in that claim 24, wherein~~ the controlled polymerization is a variant of ATRP polymerization.

Claim 28 (currently amended). The method of ~~any one of claims 15 to 27, characterized in that claim 15, wherein~~ radical stabilization is effected using polymer-bonded or non-polymer-bonded nitroxides of the type (NIT 1) or (NIT 2):



(NIT 1)



(NIT 2)

where $R^{\#1}$, $R^{\#2}$, $R^{\#3}$, $R^{\#4}$, $R^{\#5}$, $R^{\#6}$, $R^{\#7}$ and $R^{\#8}$ independently of one another can denote the following groups:

- i) halides,
- ii) linear, branched, cyclic and heterocyclic hydrocarbons having 1 to 20 carbon atoms, which may be saturated, unsaturated or aromatic;
- iii) $-\text{COOR}^{\#9}$, $-\text{OR}^{\#10}$ and $-\text{PO}(\text{OR}^{\#11})_2$, where $\text{R}^{\#9}$, $\text{R}^{\#10}$ and $\text{R}^{\#11}$ stand for radicals from group ii).

Claim 29 (currently amended). The method of ~~any one of claims 15 to 28, characterized in that claim 15, wherein~~ crosslinkers ~~added are selected from the group consisting of~~ metal chelates, ~~especially aluminum chelates or titanium chelates~~, isocyanates, amines, alcohols and/or epoxides are added.

Claim 30 (currently amended). The method of ~~any one of claims 15 to 29, characterized in that claim 15, wherein~~ the polymers are crosslinked by actinic radiation, ~~preferably using polyfunctional acrylates or methacrylates~~.

Claim 31 (currently amended). The method of ~~any one of claims 15 to 30, characterized in that claim 15, wherein~~ the polymers are crosslinked by UV radiation, ~~preferably using UV-absorbing photoinitiators~~.

Claim 32 (currently amended). ~~The use of a pressure-sensitive adhesive tape of any one of claims 1 to 14 A method~~ for mounting printing plates, ~~especially multilayer photopolymer printing plates~~, to printing cylinders or sleeves which comprises mounting said printer plates with the adhesive tape of claim 1.

Claim 33 (new) The method of claim 21, wherein said initiator having a grafting activity of $\varepsilon > 10$ is bis(4-tert-butylcyclohexyl) peroxide dicarbonate or dibenzoyl peroxide.